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Specification and Drawings, as originally filed, with Application for Patent Serial No:
2,432,669, on June 17, 2003, by **IBM CANADA LIMITED-IBM CANADA LIMITÉE**,
assignee of Howard Borenstein, Victor S. Chan and Lev Mirlas, for "Method and System for
Referencing Trading Agreements".

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August 6, 2003

Date

(CIPO 68)
04-09-02

Canada

O P I C C I P O

ABSTRACT

An electronic commerce system supports on-line stores that are accessible by a set of buyers. Each buyer is associated with one of a set of one or more organizations. The electronic commerce system
5 includes the ability to define a base trading agreement with terms and conditions for associated buyers and on-line stores, store settings with terms and conditions associated with one of the on-line stores, and customer preferences trading agreements, associated with organizations. The system includes an application interface for returning a set of governing terms and conditions for a buyer-store electronic commerce session, based on the associated base, store settings and customer
10 preferences trading agreements.

METHOD AND SYSTEM FOR REFERENCING TRADING AGREEMENTS

Field of the Invention

The present invention relates generally to electronic commerce web-based systems and in particular to referencing models for trading agreements.

Background of the Invention

In an electronic commerce (e-commerce) session a buyer places orders with a supplier in accordance with a trading agreement. In an e-commerce session the trading agreement includes terms and conditions that describe specifications for, or limitations on, the business processes that are available to the buyer during the e-commerce session. The business logic of the e-commerce session is governed by the defined set of terms and conditions for the buyer and the supplier for that e-commerce session. Different terms and conditions may apply at different times and for different buyers.

In some situations it is inefficient to require that the entire set of terms and conditions are specified in a single, uniquely defined, trading agreement for each buyer/supplier interaction. Certain common terms and conditions may be defined for multiple trading agreements. For example, IBM Corporation markets WebSphere Commerce™ that is an electronic commerce system in which a contract may reference another trading agreement (known as a business account) that is defined to be common for a defined buyer organization. Such inclusion by reference allows a "business account" to specify terms and conditions for an entire buyer organization, while a specific trading agreement specifies the terms and conditions for the e-commerce transaction between the individual buyers in that organization and the supplier. In this type of e-commerce system, a buyer organization is expected to have a single business account but many contracts are expected to reference the same business account.

Such an approach, however, may require duplication among the terms and conditions for various organizations. For example, hosted stores in a single e-commerce system may all be governed by a single set of terms and conditions, called a 'hosting contract', that must be respected

by all trading agreements used by all stores hosted by the e-commerce system. In such a case, each separate business account will contain the same terms and conditions reflecting the hosting contract. Where such hosting contract terms and conditions are modified, each business account for hosted stores will require appropriate alterations.

5 In e-commerce systems the management of trading agreements may also become fragmented. Typically, a single trading agreement is structured as a single object. However, it is also common for different users to specify different sets of terms and conditions within that single object. It is potentially unwieldy to allow different participants to edit different subsets of the terms and conditions in the object that defines a trading agreement.

10 For example, a contract trading agreement typically includes terms and conditions to specify a set of available products and prices covered by the contract. A buyer may wish to further restrict the set of products, and may also seek to restrict the set of permitted payment methods or ship-to addresses. Placing the latter terms and conditions in the contract typically requires involvement of a contract administrator to include the terms in the trading agreement and to manage 15 any modifications as the buyer's needs change. Given a large number of contracts, the contract administrators are required to carry out significant amounts of updating of individual trading agreements.

20 A further issue arises when an organization setting up an e-commerce web site does not wish to create the entire set of required terms and conditions for each customer. The business model of the organization may require only a limited set of 'template' contracts. In such a situation, the definition of a set of terms and conditions for each customer will not be as efficient as asserting that the customer is to be associated with one of a set of template terms and conditions, as modified by some small set of changes to the terms and conditions.

25 Such templates are disclosed in Patent Cooperation Treaty Patent Application Publication Number WO 00/70484, published November 23, 2000, entitled "A Market Operating System" naming Christopher Jens Cook as inventor. In the Cook reference a buyer and a seller are able to

complete an agreement. The seller is able to access a template for an agreement based on the trade options that the seller specifies. For a given template, the seller will specify the terms that apply for the particular transaction, either by providing the information manually or by selecting from stored options. Such an approach, although utilizing templates to permit reuse of terms, requires the seller to construct a specific agreement for each transaction by selecting from options provided. The Cook reference system therefore requires input by the seller for each transaction.

It is therefore desirable to provide an e-commerce system that permits a flexible and automated definition of terms and conditions for trading agreements that are to govern e-commerce sessions.

10 **Summary of the Invention**

Accordingly, the present invention provides a system and method for improved definition and management of terms and conditions in e-commerce trading agreements governing e-commerce sessions.

According to an aspect of the present invention there is provided a computer program product for implementing an electronic commerce system supporting on-line stores accessible by a set of buyers, each buyer having a buyer representation in the electronic commerce system, each buyer representation being associated with one of a set of one or more organizations, the computer program product including a computer usable medium having computer readable program code means embodied in the medium, and including:

20 computer readable program code means for defining and maintaining a set of customer trading agreement data items, each including terms and conditions associated with one of the set of buyer representations and one or more of the on-line stores,

25 computer readable program code means for defining and maintaining a set of base trading agreement data items including terms and conditions, each of the base trading agreement data items being available for reference by one or more of the customer trading

agreement data items or one or more of others of the set of base trading agreement data items,

5 computer readable program code means for defining and maintaining a set of store settings trading agreement data items, each store settings trading agreement data item being associated with one of the on-line stores,

computer readable program code means for defining and maintaining a set of organization-specific trading agreement data items, each organization-specific trading agreement data item being associated with one of the set of organizations, and

10 computer readable program code means for implementing an application interface for returning a set of governing terms and conditions for a buyer-store electronic commerce session, based on the referenced customer, base, store settings and organization-specific trading agreement data items.

15 According to an aspect of the present invention there is provided the above computer program product in which the application interface for returning a set of governing terms and conditions determines the set of governing conditions for the buyer-store electronic commerce session by taking the union set of the terms and conditions specified in the following trading agreements, where such agreements are defined to include:

the customer trading agreement data item for the buyer-store electronic commerce session,

20 any base trading agreement data items referenced by the customer trading agreement data item and by other referenced base trading agreements,

any store settings trading agreement data items for the store of the buyer-store electronic commerce session, and

any organization-specific trading agreement data items for the ancestor

organizations to the buyer representation in the buyer-store electronic commerce session.

According to an aspect of the present invention there is provided the above computer program product in which the application interface for returning a set of governing terms and conditions determines the set of governing terms and conditions for the buyer-store electronic commerce session by applying a set of conflict rules to the set of the terms and conditions in the union set of the trading agreements.

According to an aspect of the present invention there is provided the above computer program product further including computer readable program code means for defining and maintaining a cache memory used for the storage and retrieval of store setting trading agreement data items.

According to an aspect of the present invention there is provided the above computer program product further including computer readable program code means for defining and maintaining a cache memory for storage and retrieval of referencing information regarding trading agreements and referenced trading agreement data items.

According to an aspect of the present invention there is provided an electronic commerce system supporting on-line stores accessible by a set of buyers, each buyer having a buyer representation in the electronic commerce system, each buyer representation being associated with one of a set of one or more organizations, the system including

means for defining and maintaining a set of customer trading agreement data items, each including terms and conditions associated with one of the set of buyer representations and one or more of the on-line stores,

means for defining and maintaining a set of base trading agreement data items including terms and conditions, each of the base trading agreement data items being available for reference by one or more of the customer trading agreement data items or one or more of others of the set of base trading agreement data items,

means for defining and maintaining a set of store settings trading agreement data items, each store settings trading agreement data item being associated with one of the on-line stores,

5 means for defining and maintaining a set of organization-specific trading agreement data items, each organization-specific trading agreement data item being associated with one of the set of organizations, and

an application interface for returning a set of governing terms and conditions for a buyer-store electronic commerce session, based on the referenced customer, base, store settings and organization-specific trading agreement data items.

10 According to another aspect of the present invention there is provided a computer-implemented method for defining governing terms and conditions for a transaction in an electronic commerce system, the system supporting on-line stores accessible by a set of buyers, each buyer having a buyer representation in the electronic commerce system, each buyer representation being associated with one of a set of one or more organizations, the method including

15 defining and maintaining a set of customer trading agreement data items, each including terms and conditions associated with one of the set of buyer representations and one or more of the on-line stores,

20 defining and maintaining a set of base trading agreement data items including terms and conditions, each of the base trading agreement data items being available for reference by one or more of the customer trading agreement data items or one or more of others of the set of base trading agreement data items,

defining and maintaining a set of store settings trading agreement data items, each store settings trading agreement data item being associated with one of the on-line stores,

defining and maintaining a set of organization-specific trading agreement data items,

each organization-specific trading agreement data item being associated with one of the set of organizations, and

5 determining the governing terms and conditions for the buyer-store electronic commerce session for the transaction, based on any referenced customer, base, store settings and organization-specific trading agreement data items.

According to another aspect of the present invention there is provided a computer program product including a computer-readable signal-bearing medium, the medium including means for accomplishing the above method and the medium being one of recordable data storage medium, and modulated carrier signals (including signals being transmission over the Internet network).

10 The present invention thus improves the ability to specify terms and conditions for e-commerce sessions. The approach of the invention permits a single infrastructure to control the business logic that governs the sessions and define trading agreements in a flexible way.

Brief Description of the Drawings

15 In drawings which illustrate by way of example only a preferred embodiment of the invention,

Figure 1 is a block diagram showing a simple example configuration of an e-commerce system in accordance with a preferred embodiment.

Figure 2 is a flowchart showing steps taken in accordance with the preferred embodiment.

Detailed Description of the Invention

20 The preferred embodiment may be used to define e-commerce web sites. The preferred embodiment allows users to define e-commerce stores accessible to buyers. A simplified example configuration of a set of e-commerce web sites, and associated data structures, defined by an e-commerce system in accordance with a preferred embodiment of the invention is shown in the block diagram of Figure 1. The system of the preferred embodiment permits the development of web sites

implementing on-line stores that are accessible to buyers. The example in Figure 1 shows stores 10, 12. In the preferred embodiment, buyers are registered in the e-commerce system and a buyer representation is defined in the system. Buyers represented in the e-commerce system are each associated with one of a set of organizations, also represented in the e-commerce system. The 5 example of Figure 1 shows buyers 14, 15 associated with organization 16 that is, in turn, associated with organization 18. As Figure 1 shows, in the system of the preferred embodiment organizations may be defined to be parents or children of other organizations.

In the e-commerce system of the preferred embodiment, a buyer will interact with a store in a way that is defined in part by a set of terms and conditions. In the preferred embodiment, the 10 terms and conditions for the buyer-store interaction are defined dynamically based on a set of trading agreements that are defined in the e-commerce system. In effect, when a buyer accesses a store web site a governing set of terms and conditions is defined. In the preferred embodiment a trading component provides applications with a set of interfaces to permit the look up of relevant terms and conditions for the governing trading agreement. The description below sets out how this set of 15 governing terms and conditions is generated, using the example of Figure 1.

In the preferred embodiment, there is a customer trading agreement definable for each buyer and there are three types of trading agreements potentially defined and accessible to allow the system to generate a governing set of terms and conditions. These three types of accessible agreements are:

- 20 1. Base trading agreements;
2. Customer Preferences; and
3. Store Settings.

For each buyer-store combination, there is a customer trading agreement specified. This 25 agreement contains terms and conditions used to define the governing terms and conditions of the trading arrangement between the buyer and the store the buyer is deal with. In the example of Figure

1, customer trading agreement 19 is a customer trading agreement specified for buyer 14 and store
12. In the preferred embodiment, a customer trading agreement may refer to base trading
agreements. Figure 1 shows customer trading agreement 19 referencing base trading agreement 20.
Similarly, the interaction between buyer 15 and store 12 is subject to customer trading agreement
5 21, which also references base trading agreement 20. Base trading agreement 20, in turn, references
base trading agreement 22. In the preferred embodiment, the union of the terms and conditions of
trading agreements 19, 20, 22 is calculated and this union is part of what is used in determining the
governing terms and conditions for buyer 14 and store 12. Similarly, the union of terms and
conditions in trading agreements 21, 20, 22 are partially determinative of the governing terms and
10 conditions for buyer 15 using store 12.

As will be described below, the set union operator is used for the different sets of terms and
conditions that are defined as potentially influencing the governing terms and conditions for a buyer
and store in the e-commerce system. As is also referred to, there are also a number of conflict rules
15 that may be implemented in the e-commerce system to avoid incompatible terms and conditions
being included in the governing set. Apart from these conflict rules, the approach of the preferred
embodiment is to take the union of all terms and conditions.

The second type of terms and conditions that are definable in the preferred embodiment are
customer preference terms and conditions. These are definable for different organizations
represented in the e-commerce system. The simple example of Figure 1 shows customer preferences
20 24, 26 defined in association with organizations 16, 18, respectively. The customer preference terms
and conditions are determined by finding all customer preference trading agreements for all
organizations which are parents of the organization with which the buyer is associated, and returning
the union of all terms and conditions in those trading agreements. It will be noted that each set of
25 customer preference terms and conditions are specific to a defined organization. The preferred
embodiment defines the customer preference terms and conditions by accessing all parent
organizations of the organization to which the buyer belongs. However, other implementations may
access only a defined subset of the parent organizations to determine the applicable terms and

conditions.

The third type of terms and conditions are those in the store settings for the store in question. In the example implementation of Figure 1, store 10 has associated store settings 28 and store 12 has associated store settings 30. The store settings are terms and conditions that are intended to apply to all transactions carried out at the store's web site. Thus the terms and conditions defined in store settings 28 are automatically appended to all contracts and other trading agreements for store 10.

Examples of the types of customer preferences terms and conditions include:

- acceptable ship-to addresses
- acceptable shipping modes
- acceptable payment methods
- product catalog inclusions and exclusions

The types of terms and conditions definable for store settings may include these same terms and conditions that are definable for the customer preferences.

As may be seen from this description and the further detail set out below, the approach of the preferred embodiment allows a single infrastructure to be used to define the business logic for different stores, organizations, and buyers. The custom business logic required in other systems is not required in the system of the preferred embodiment. In the preferred embodiment, the governing terms and conditions for a transaction are determined by querying the appropriate customer trading agreement. The result of the query will be the system carrying out steps so that the entire set of governing terms and conditions are returned. While an appropriate application simply calls an interface to look up a set of terms and conditions for the customer trading agreement, the implementation of the interface looks for terms and conditions in the three other types of trading agreements, as referred to above. This is seen with reference to the flowchart of Figure 2.

In the system of the preferred embodiment, it is possible to query the appropriate customer trading agreement for terms and conditions of a defined type. For example, payment terms and conditions or shipping terms and conditions may be separately queried for. The steps shown in Figure 2 may be carried out for terms and conditions of a defined type only, or for the entire set of terms and conditions.

The steps shown in Figure 2 are followed in the lookup interface of the preferred embodiment to find such governing terms and conditions for the interaction between a buyer and a store:

1. The system initially looks up terms and conditions, for the requested trading agreement, by locating the customer trading agreement (step 40)

2. Terms and conditions from the located trading agreement are added to a result set (step 42);

3. The agreement is checked for a referencing term in the trading agreement (decision step 44). If so, the referenced base trading agreement is located (step 46) and step 2 is repeated;

4. In the case where the store has a 'store settings' trading agreement, its terms and conditions are added to the result set (step 48);

5. The parent organization of the buyer is located (step 50);

6. A check determines whether the parent organization has a 'customer preferences' trading agreement. If the parent organization does have a customer preferences trading agreement, then the terms and conditions are added to the result set (step 52).

7. Whether there is a parent for the current organization is determined (decision step 54).

If there is, find that parent organization, and repeat step 6 above (step 56).

8. Return the result set of terms and conditions to the application (step 58).

In the preferred embodiment, caching techniques are used to improve performance. For example:

- all store setting trading agreements are cached in memory; and

5 - a lazy-fetch cache of relationships between trading agreements is implemented. Thus, once a trading agreement is found to reference another trading agreement, this referencing relationship is kept in memory. This way, in step (3) above, before looking for a referencing base trading agreement, the cache is checked first, to see whether this trading agreement already is known to reference another trading agreement. If an entry exists indicating the referenced trading agreement, then that trading agreement is used. If an entry exists in the cache indicating that this 10 trading agreement does not reference any other trading agreements, then a trading agreement reference is no longer looked for. A search for a trading agreement reference only continues if no cache entry exists for the requested trading agreement.

15 It is expected that in most implementations of e-commerce web sites defined using the system of the preferred embodiment, there will be fewer referenced base trading agreements than base trading agreements that are directly related to a buyer-store session. Therefore, it is desirable to have a separate cache of all referenced trading agreements and their terms and conditions, from the cache of requested trading agreements and their terms and conditions.

20 The above description refers to the union of terms being taken to give a result set of governing terms and conditions. However, in the system of the preferred embodiment it is possible to define conflict rules to prevent the union operation giving a result set that includes inconsistent terms and conditions. Such rules are defined in an implementation-specific manner. The system of the preferred embodiment permits such conflict rules to be defined to avoid defined inconsistent terms.

25 In the description above, there are store settings trading agreements and customer preferences trading agreements that are definable by the system of the preferred embodiment. The

system of the preferred embodiment may be extended to include other entities that potentially influence the terms and conditions of the buyer-store interaction. For example, the system may be extended to include representations of laws and regulations for different jurisdictions. The system may include terms and conditions that the local laws of a jurisdiction include in buyer contracts.

5 Such additional terms and conditions may be dealt with in the manner set out above for customer preferences trading agreements.

The example of terms and conditions mandated by laws and regulations may be implemented by including the local jurisdiction as an organization in the hierarchy of organizations to which a buyer belongs. Alternatively, the system of the preferred embodiment may be extended to include a separate set of legal jurisdiction organizations that have related terms and conditions which are represented in the system and which are accessed to determine governing terms and conditions for a buyer-store interaction. In the latter case the system will be modified to access the defined terms and conditions for the relevant local jurisdiction as part of the steps in determining the governing terms and conditions. These types of terms and conditions are, like the customer preferences terms and conditions referred to above, organization-specific.

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Various embodiments of the present invention having been thus described in detail by way of example, it will be apparent to those skilled in the art that variations and modifications may be made without departing from the invention. The invention includes all such variations and modifications as fall within the scope of the appended claims.

WHAT IS CLAIMED IS:

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

- 5 1. A computer program product for implementing an electronic commerce system supporting on-line stores accessible by a set of buyers, each buyer having a buyer representation in the electronic commerce system, each buyer representation being associated with one of a set of one or more organizations, the computer program product comprising a computer usable medium having computer readable program code means embodied in said medium, and comprising:

10 computer readable program code means for defining and maintaining a set of customer trading agreement data items, each comprising terms and conditions associated with one of the set of buyer representations and one or more of the on-line stores,

15 computer readable program code means for defining and maintaining a set of base trading agreement data items comprising terms and conditions, each of the base trading agreement data items being available for reference by one or more of the customer trading agreement data items or one or more of others of the set of base trading agreement data items,

computer readable program code means for defining and maintaining a set of store settings trading agreement data items, each store settings trading agreement data item being associated with one of the on-line stores,

20 computer readable program code means for defining and maintaining a set of organization-specific trading agreement data items, each organization-specific trading agreement data item being associated with one of the set of organizations, and

computer readable program code means for implementing an application interface for returning a set of governing terms and conditions for a buyer-store electronic commerce session, based on the referenced customer, base, store settings and organization-specific

trading agreement data items.

2. The computer program product of claim 1 in which the application interface for returning a set of governing terms and conditions determines the set of governing conditions for the buyer-store electronic commerce session by taking the union set of the terms and conditions specified in the following trading agreements, where such agreements are defined to comprise:

- a. the customer trading agreement data item for the buyer-store electronic commerce session,
- b. any base trading agreement data items referenced by the customer trading agreement data item and by other referenced base trading agreements,
- c. any store settings trading agreement data items for the store of the buyer-store electronic commerce session, and
- d. any organization-specific trading agreement data items for the ancestor organizations to the buyer representation in the buyer-store electronic commerce session.

3. The computer program product of claim 2 in which the application interface for returning a set of governing terms and conditions determines the set of governing terms and conditions for the buyer-store electronic commerce session by applying a set of conflict rules to the set of the terms and conditions in the union set of the said trading agreements.

4. The computer program product of claim 1 further comprising computer readable program code means for defining and maintaining a cache memory used for the storage and retrieval of store setting trading agreement data items.

5. The computer program product of claim 1 further comprising computer readable program code means for defining and maintaining a cache memory for storage and retrieval of referencing information regarding trading agreements and referenced trading agreement data items.

6. An electronic commerce system supporting on-line stores accessible by a set of buyers, each buyer having a buyer representation in the electronic commerce system, each buyer representation being associated with one of a set of one or more organizations, the system comprising

5 means for defining and maintaining a set of customer trading agreement data items, each comprising terms and conditions associated with one of the set of buyer representations and one or more of the on-line stores,

10 means for defining and maintaining a set of base trading agreement data items comprising terms and conditions, each of the base trading agreement data items being available for reference by one or more of the customer trading agreement data items or one or more of others of the set of base trading agreement data items,

15 means for defining and maintaining a set of store settings trading agreement data items, each store settings trading agreement data item being associated with one of the on-line stores,

20 means for defining and maintaining a set of organization-specific trading agreement data items, each organization-specific trading agreement data item being associated with one of the set of organizations, and

an application interface for returning a set of governing terms and conditions for a buyer-store electronic commerce session, based on the referenced customer, base, store settings and organization-specific trading agreement data items.

7. The system of claim 6 in which the application interface for returning a set of governing terms and conditions determines the set of governing conditions for the buyer-store electronic commerce session by taking the union set of the terms and conditions specified in the following trading agreements, where such agreements are defined to comprise:

the customer trading agreement data item for the buyer-store electronic commerce session,

any base trading agreement data items referenced by the customer trading agreement data item and by other referenced base trading agreements,

5 any store settings trading agreement data items for the store of the buyer-store electronic commerce session, and

any organization-specific trading agreement data items for the ancestor organizations to the buyer representation in the buyer-store electronic commerce session.

8. The system of claim 7 in which the application interface for returning a set of governing terms
10 and conditions determines the set of governing terms and conditions for the buyer-store electronic commerce session by applying a set of conflict rules to the set of the terms and conditions in the union set of the said trading agreements.

9. The system of claim 6 in which a cache memory is used to store setting trading agreement data items.

15 10. The system of claim 6 in which a cache memory is used to store referencing information regarding trading agreements and for storing referenced trading agreement data items.

11. A computer-implemented method for defining governing terms and conditions for a transaction in an electronic commerce system, the system supporting on-line stores accessible by a set of buyers, each buyer having a buyer representation in the electronic commerce system, each buyer representation being associated with one of a set of one or more organizations, the method comprising
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defining and maintaining a set of customer trading agreement data items, each comprising terms and conditions associated with one of the set of buyer representations and one or more of the on-line stores,

defining and maintaining a set of base trading agreement data items comprising terms and conditions, each of the base trading agreement data items being available for reference by one or more of the customer trading agreement data items or one or more of others of the set of base trading agreement data items,

5 defining and maintaining a set of store settings trading agreement data items, each store settings trading agreement data item being associated with one of the on-line stores,

10 defining and maintaining a set of organization-specific trading agreement data items, each organization-specific trading agreement data item being associated with one of the set of organizations, and

15 determining the governing terms and conditions for the buyer-store electronic commerce session for the said transaction, based on any referenced customer, base, store settings and organization-specific trading agreement data items.

12. The method of claim 11 in which the step of determining the governing terms and conditions
15 comprises the step of taking the union set of the terms and conditions specified in the trading agreements defined to comprise:

the customer trading agreement data item for the buyer-store electronic commerce session,

20 any base trading agreement data items referenced by the customer trading agreement data item and by other referenced base trading agreements,

any store settings trading agreement data items for the store of the buyer-store electronic commerce session, and

any organization-specific trading agreement data items for the ancestor organizations to the buyer representation in the buyer-store electronic commerce session.

13. The method of claim 12 in which the step of returning a set of governing terms and conditions further comprises the step of applying a set of conflict rules to the set of the terms and conditions in the union set of the said trading agreements.
- 5 14. The method of claim 11 further comprising the step of placing a copy of store setting trading agreement data items in a cache memory.
15. The method of claim 11 further comprising the step of storing referencing information regarding trading agreements and referenced trading agreement data items in a cache memory.
16. A computer program product comprising a computer-readable signal-bearing medium, the said medium comprising means for accomplishing the method of any of claims 11 to 15.
- 10 17. The computer program product of claim 16 in which the medium is a recordable data storage medium.
18. The computer program product of claim 16 in which the medium is a modulated carrier signal.
19. The computer program product of claim 16 in which the signal is a transmission over a network.
20. The computer program product of claim 19 claim in which network is the Internet.

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